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TWO NEW SPECIES OF THE *DICTYOTUS* GROUP OF THE GENUS *EXALLONYX* (HYMENOPTERA: PROCTOTRUPIDAE) FROM CHINA, WITH A KEY TO THE WORLD SPECIES

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Abstract.—***Exallonyx rufimandibularis*, n. sp.**, and ***E. arcus*, n. sp.**, from China are described and illustrated. A key to the world species of the *Exallonyx* (*Exallonyx*) *dictyotus* group is given.

Key Words: Hymenoptera, Proctotrupidae, *Exallonyx*, new species, China

Exallonyx Kieffer, 1904, parasitoids of Staphylinidae (Coleoptera), is the largest genus of the tribe Proctotrupini, and also the largest in the family Proctotrupidae (Townes and Townes 1981, Fan and He 2003, He and Fan 2004). This genus includes two subgenera, *Eocodrus* Panzer and *Exallonyx* Kieffer. The subgenus *Exallonyx* is divided into eleven species groups (Townes and Townes 1981). The *Dictyotus* group is a small species group including fourteen species, one from Madagascar, three from China, and the rest from New Guinea (Townes and Townes 1981, He and Fan 2004, Liu et al. 2006). In this paper we described two additional species of the *dictyotus* group from China.

The descriptions follow the terminology used by Townes and Townes (1981) and He and Fan (2004). The type specimens are deposited in the Hymenoptera Collection of Zhejiang University, Hangzhou, China (ZU).

Key to the World Species of the *Exallonyx* (*Exallonyx*) *dictyotus* group (Modified from Townes and Townes 1981)

Female

1. Wings blackish; flagellum with apical four or more segments light brown to white . . . 2
– Wings hyaline or weakly tinged with brown or fuscous (Fig. 2); flagellum entirely black 4
2. Occipital carina unusually high; epomia absent; abdominal stalk almost smooth, upper profile concave (New Guinea) . . . . . *E. camelinus* Townes
– Occipital carina moderately high; epomia present; abdominal stalk with conspicuous grooves, upper profile straight 3
3. Abdominal stalk 1.65× as long as deep, grooves on side moderately fine and shallow (New Guinea) . . . *E. soror* Townes
– Abdominal stalk 1.1× as long as deep, grooves on side moderately coarse and deep (New Guinea) . . . *E. torquatus* Townes
4. Side of abdominal stalk with four transverse ridges on basal half, nearly smooth on apical half with only one distinct longitudinal groove (Figs. 4, 6) (China) . . . . . *E. rufimandibularis*, n. sp.

– Side of abdominal stalk fully with distinct grooves, not smooth on apical half 5
5. Hind trochanter whitish 6
– Hind trochanter black or dark brown . . . 7
6. Second flagellar segment 3.0× as long as wide; hind femur 4.2× as long as wide (New Guinea) . . . . . *E. dictyotus* Townes
– Second flagellar segment 3.8× as long as wide; hind femur 5.7× as long as wide (New Guinea) . . . . . *E. cracenus* Townes
7. Flagellum enlarged apically; hind femur 5.5× as long as wide (New Guinea) . . . . . *E. dilatus* Townes
– Flagellum not enlarged apically; hind femur 3.6 to 4.9× as long as wide 8
8. Abdominal stalk 1.9× as long as deep (New Guinea) . . . . . *E. ejuncidus* Townes
– Abdominal stalk 1.3× as long as deep (New Guinea) . . . . . *E. coracinus* Townes

Male

1. Upper margin of pronotum without a row of hairs; base of syntergite with five longitudinal grooves of almost equal length (Madagascar) . . . . . *E. nimius* Townes
– Upper margin of pronotum with one or two rows of hairs; base of syntergite with a single long median groove or with a median groove and one to three lateral grooves about half as long as median groove 2
2. Flagellum with apical four or more segments stramineous whitish (New Guinea) . . . . . *E. torquatus* Townes
– Flagellum entirely dark brown to black . . 3
3. Flagellum entirely dark brown; abdominal stalk with arcuate transverse ridges at the basal half in dorsal view (Fig. 11) (China) . . . . . *E. arcus*, n. sp.
– Flagellum entirely black; abdominal stalk without arcuate transverse ridges at the basal half in dorsal view 4
4. Wing blackish 5
– Wing tinged with yellowish brown or weakly infuscate 6
5. Abdominal stalk 2.0× as long as deep, grooves on side sloping downward at front end; small punctures on upper front part of metapleurom very sparse (New Guinea) . . . . . *E. climatus* Townes
– Abdominal stalk as long as deep, grooves on side approximately horizontal; small punctures on upper front part of metapleurom sparse (New Guinea) . . . . . *E. melanoptera* Townes
6. Hind trochanter black 7
– Hind trochanter whitish or reddish brown 8
7. Upper margin of pronotum with one row of hairs; epomia absent (New Guinea) . . . . . *E. coracinus* Townes
– Upper margin of pronotum with two rows of hairs; epomia distinct (China) . . . . . *E. nigrolabius* Liu, He, and Xu
8 Upper margin of pronotum with two rows of hairs; flagellum with conspicous tyloid. . . . . *E. hangzhouensis* He and Fan
– Upper margin of pronotum with one row of hairs; flagellum without conspicous tyloids 9
9. Hind femur 3.7× as long as wide; abdominal stalk 0.5× as long as deep; epomia distinct (China) . . . . . *E.brevicarinus* Liu, He, and Xu
– Hind femur 4.4× to 5.2× as long as wide; abdominal stalk 0.9× to 1.3× as long as deep; epomia absent. 10
10 Scape fulvous or light brown; hind femur 4.4× as long as wide; abdominal stalk 0.9× as long as deep (New Guinea) . . . . . *E. dictyotus* Townes
– Scape black; hind femur 5.2× as long as wide; abdominal stalk 1.3× as long as deep (New Guinea) . . . . . *E. cracens* Townes

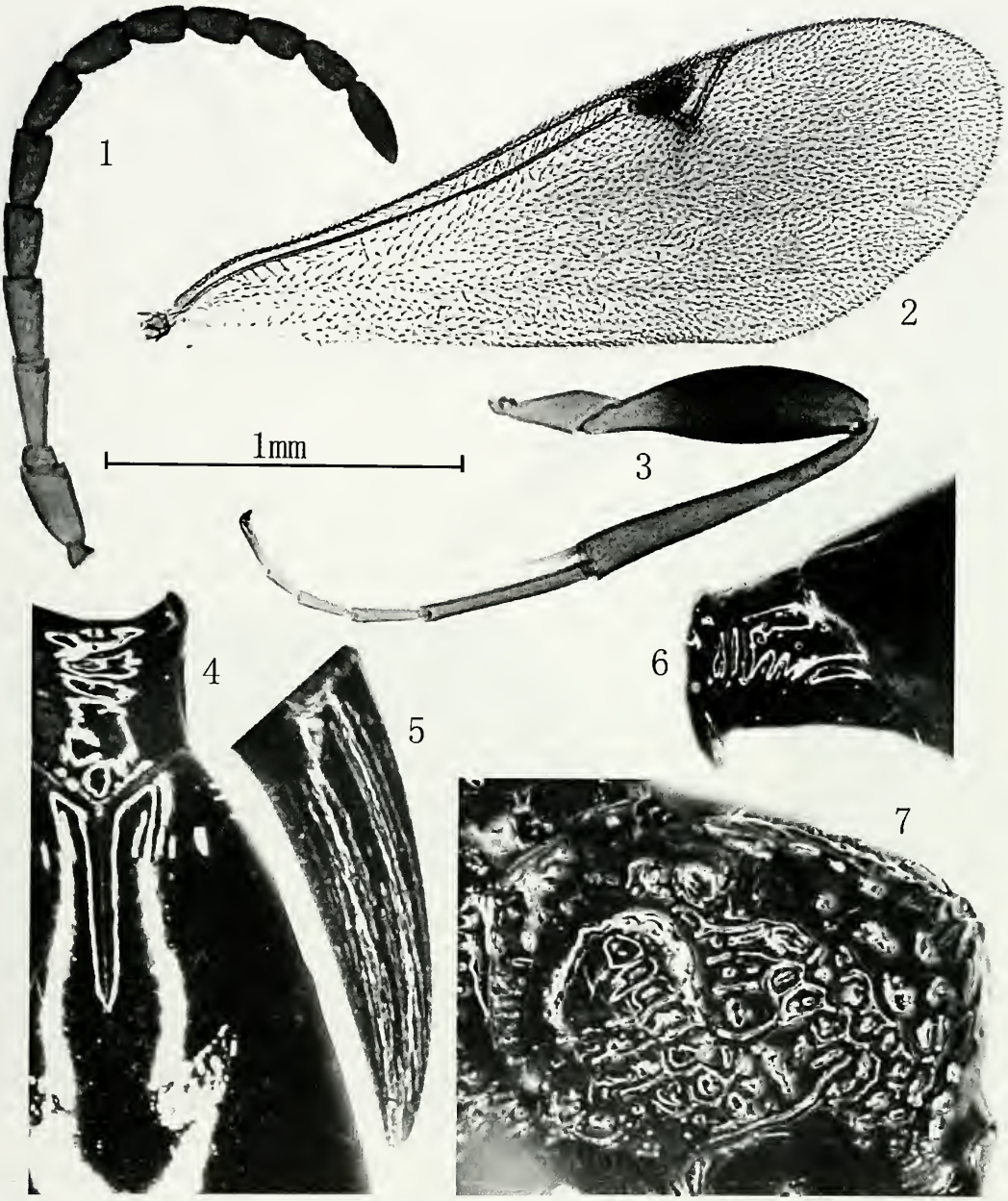
Exallouyx rufimandibularis Xu, Liu, and He, new species

(Figs. 1–7)

Female.—Front wing length 3.0 mm. *Color:* Body black. Antenna reddish brown to dark reddish brown, with gradual transition from reddish brown at base to dark reddish brown at apex. Labrum and apical half of mandible reddish brown. Palpi yellow. Tegula fulvous. Legs reddish brown except coxae black, and trochanters and tarsi fulvous. Front wing hyaline, stigma and strong veins brown, weak veins colorless.

Head: Temple 0.91× as long as eye in dorsal view. Cheek 0.41× as long as longest diameter of eye. Clypeus 2.7× as wide as long, weakly convex, apex truncate. Second flagellar segment 2.2× as long as wide. Tenth flagellar segment 1.6× as long as wide. Apical segment 1.6× as long as penultimate segment (Fig. 1). Area between antennal sockets with a strong, high carina.

Mesosoma: Pronotum with three transverse wrinkles on collar. Epomia



Figs. 1–7. *Exallonyx rufimandibularis*. 1, Antenna. 2, Front wing. 3, Hind leg. 4, Abdominal stalk, dorsal. 5, Ovipositor sheath. 6, Abdominal stalk, lateral; 7, Posterior part of mesosoma, lateral.

distinct. Side of pronotum without hairs behind epomia and upper end of carina on collar. Upper margin of pronotum with a single row of hairs. Lower corner of pronotum with a single pit. Front edge of mesopleuron with a patch of hairs on upper corner, elsewhere hairless. Speculum with sparse hairs on upper 0.5. Lower half of mesopleuron with sparse hairs, except hairless along horizontal groove; posterior lower corner with parallel wrinkles. Smooth area of metapleuron 0.3× as long as metapleuron and 0.53× as deep as metapleuron, rest of metapleuron with

reticulate wrinkles. Upper margin of propodeum angular in lateral view. Upper face of propodeum rugose, with a very small smooth area at base. Median ridge of propodeum incomplete and reaching to middle of hind face. Hind face weakly winkled on basal half and smooth on apical half. Pleural face of propodeum with reticulate wrinkles. Hind femur 3.7× as long as wide (Fig. 3). Longer spur of hind tibia 0.4× as long as hind basitarsus. Stigma 1.56× as long as wide, receiving radius at near middle (Fig. 2). Costal side of radial cell 0.50× as long as width of stigma; posterodistal side of stigma weakly convex. First radial vein oblique, 0.6× as long as wide. Second radial vein straight. Posterior margin of hind wing with a shallow notch at basal 0.35.

Metasoma: Abdominal stalk (Figs. 4, 6) as long as wide in dorsal view, with three weak transverse ridges on center of basal half, elsewhere smooth. Abdominal stalk as long as deep in lateral view, with four weak transverse ridges on basal half, apical half nearly smooth with only one distinct longitudinal groove. Base of syntergite with median groove reaching 0.72 to space between thyridia, on each side with two very shallow lateral grooves; sublateral groove 0.44× as long as median groove. First thyridium 2.5× as wide as long, separated from each by 0.75× width of one thyridium. Hairs on syntergite sparse and short, separated far from lower margin of syntergite. Ovipositor sheath (Fig. 5) 0.54× as long as hind tibia, 4.4× as long as wide; with fine longitudinal striations and hairs.

Male.—Unknown.

Variation.—Propodeum of paratype with strong transverse reticulate wrinkles on apical half of upper face and basal part of hind face.

Distribution.—China (Guangdong Province and Guangxi Zhuang Autonomous Region).

Material examined.—Holotype, ♀, China: National Forest Park of Liuxihe, Conghua, Guangdong Province, 13.IV.2002, Zaifu Xu, No. 20026961, deposited in ZU. Paratype: 1♀, China: Fangcheng, Guangxi Zhuang Autonomous Region, 8.VI.2000, Hong Wu, No. 2001002320, deposited in ZU.

Etymology.—The specific name is derived from the Latin adjective *rufi-* (reddish) + *mandibularis* (mandible), referring to the reddish-brown mandibles.

Remarks.—This new species is easily distinguished from those previously known by the upper margin of the propodeum angular in lateral view, upper face of abdominal stalk with three weak transverse ridges at center of basal half, and side of abdominal stalk with four weak ridges on basal half and nearly smooth on apical half.

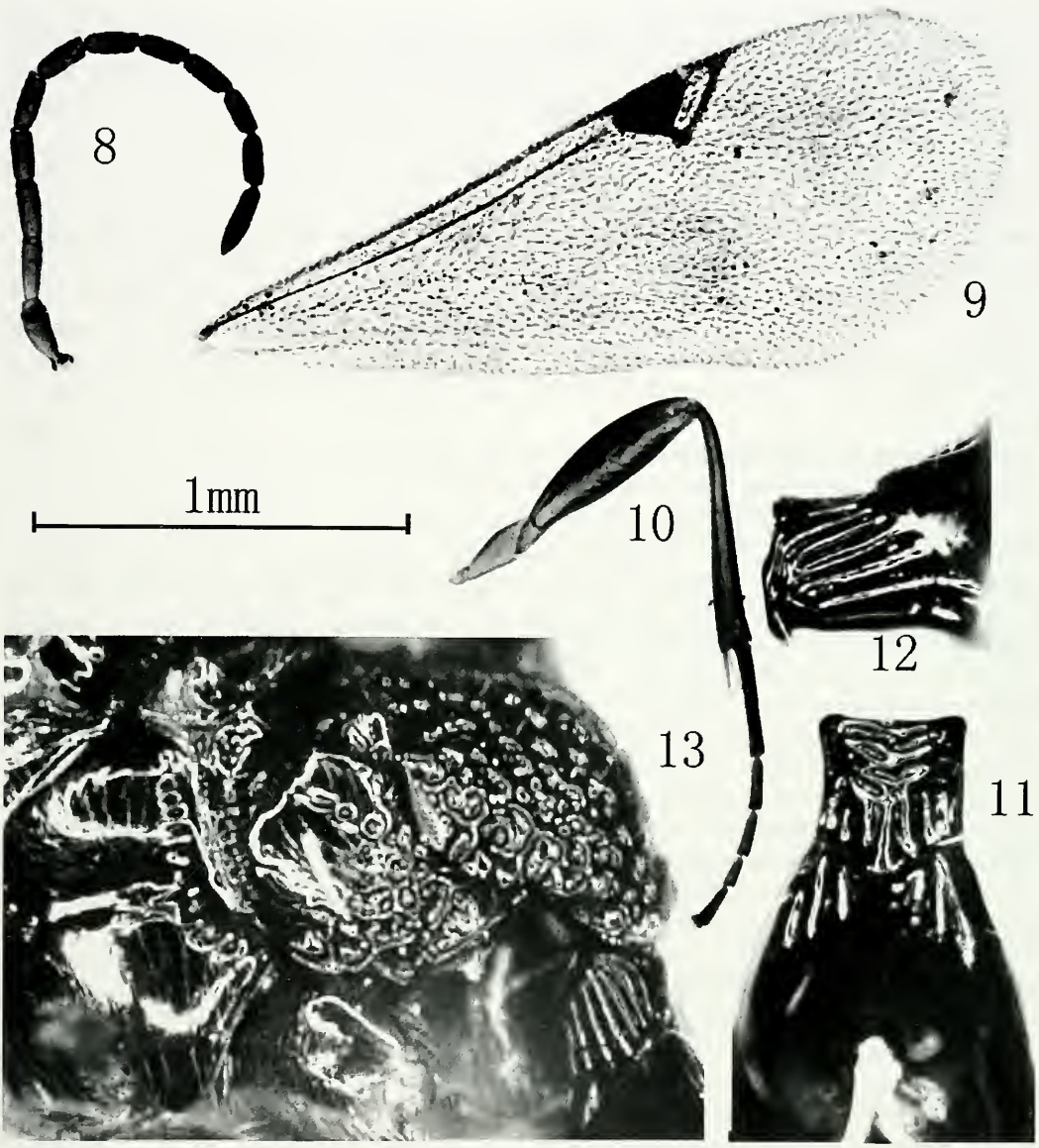
Exallonyx arcus Xu, Liu, and He, new species

(Figs. 8–13)

Male.—Front wing length 2.3 mm. *Color:* Body black. Antenna brown except scape, pedicel, and first flagellum fulvous. Labrum and apical half of mandible reddish brown. Palpi yellow. Tegula brown. Leg fulvous except front coxa light black brown, middle and hind coxae black brown. Front wing hyaline, tinged with fulvous, stigma and strong veins fulvous. Weak veins colorless.

Head: Temple 0.83× as long as eye in dorsal view. Cheek 0.31× as long as longest diameter of eye. Clypeus 3.0× as wide as long, weakly convex, apex oblique and truncate. Second flagellar segment 2.7× as long as wide. Tenth flagellar segment 3.0× as long as wide. Apical segment 1.4× as long as penultimate segment (Fig. 8). Tyloids absent. Area between antennal sockets with a weak carina.

Mesosoma: Pronotum with four to five transverse wrinkles on collar. Epomia



Figs. 8–13. *Exallonyx arcus*. 8, Antenna. 9, Front wing. 10, Hind leg. 11, Abdominal stalk, dorsal. 12, Abdominal stalk, lateral. 13, Posterior part of mesosoma, lateral.

weak. Side of pronotum without hairs behind epomia and upper end of carina on collar. Upper margin of pronotum with two rows of hairs. Lower corner with a single pit. Front edge of mesopleuron with a patch of hairs on upper corner and another above horizontal groove, hairless area 0.9× as long as tegula. Speculum with sparse hairs on upper 0.67. Lower half of mesopleuron with sparse hairs. Smooth area of metapleuron with some punctures, 0.5× as long as metapleuron and 0.75× as deep as metapleuron. Upper margin of propodeum arcuate in lateral view. Upper face of propodeum with smooth area on basal half and with fine reticulate wrinkles on apical half. Median ridge of

propodeum complete. Hind face and pleural face of propodeum with reticulate wrinkles. Hind femur 4.0× as long as wide (Fig. 10). Longer spurs of hind tibia 0.5× as long as hind basitarsus. Stigma 1.8 as long as wide, receiving radius at middle (Fig. 8). Costal side of radial cell 0.52× as long as width of stigma, posterodistal side of stigma weakly convex. First radial vein weakly oblique, 1.5× as long as wide. Second radial vein straight. Posterior margin of hind wing with a shallow notch at basal 0.35.

Metasoma: Abdominal stalk (Figs. 11, 12) 1.1× as long as wide in dorsal view, with four arcuate transverse ridges on basal half and five longitudinal ridges at apical half. Abdominal stalk 0.7× as long as deep in lateral view, underside with one transverse ridge on base, side of stalk with seven longitudinal ridges behind transverse ridge. Base of syntergite with median groove reaching 0.6 to space between thyridia, on each side with three lateral grooves, sublateral groove 0.5× as long as median groove. First thyridium 1.8× as wide as long, separated from each by 0.28 width of one thyridium. Hairs on syntergite sparse and short, separated far from the lower margin of syntergite. Claspers triangular, not decurved, sharp at tip.

Female.—Unknown.

Variation.—Side of abdominal stalk of paratype with five longitudinal ridges.

Distribution.—China (Zhejiang Province).

Material examined.—Holotype, ♂, China: Mt. Tianmushan, Zhejiang Province, 11.VI.1993, Xuexin Chen, No. 935052, deposited at ZU. Paratype: 1♂, China: same locality as holotype, 3.VII.1998, Mingshui Zhao, No. 20000119, deposited at ZU.

Etymology.—The specific name derived from the Latin adjective *arcus* (arcuate), referring to the abdominal stalk with arcuate transverse ridges at the basal half in dorsal view.

Remarks.—This new species is similar to *Exallonyx torquatus*, but it is distinguished from the latter by the upper margin of the pronotum with two rows of hairs, upper face of abdominal stalk with four arcuate transverse ridges at the basal half and five longitudinal ridges at the apical half, and median groove on basal syntergite with three lateral grooves.

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